TIPS & TECHNIQUES

Iliac Crest Bone-Muscle Transfer in Periacetabular Osteotomy

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ABSTRACT

Ganz et al reported acetabular osteotomy for extensive acetabular reorientation without changing the acetabular diameter. This article reports our modification of this surgical technique, which preserves the integrity of the tensor fascia latae muscle as well as providing viable bone for bone graft at the anterior iliac osteotomy site. The interval between the sartorius and tensor fascia lata is developed distal to the anterosuperior iliac spine. After iliac osteotomy through the anterosuperior iliac spine, the distal portion of the anterosuperior iliac spine (acetabular segment), along with its slip of tensor fascia lata (1-2 cm), is separated and shaped to fit the anterior bone gap. Two small holes are drilled into that segment and also into the distal cut surface in the anterior portion of the remaining crest so that when the sutures are tightened, the tensor muscle is preserved anatomically and bone grafting is achieved.

More than a decade ago, Ganz et al reported their initial experience with acetabular osteotomy in skeletally mature adults with symptomatic dysplasia. The operation was designed to allow extensive acetabular reorientation without changing the acetabular diameter. Advantages of this procedure included a single-incision approach, a large correction obtained in all directions including lateral and anterior rotation, preservation of blood supply to the hip joint, preservation of the posterior column with the benefit of early ambulation, and the absence of a change in the true pelvis.

After extensive anatomic study, Ganz et al reported on an initial series of 75 individuals ≤56 years. The grade of osteoarthritic changes was not described. Subsequently, Trousdale et al reported on a series of 42 patients that included 9 patients with grade III Tönnis changes (characterized by large cysts of the femoral head or acetabulum and moderate to severe loss of joint space). Common to both series was the use of a Smith-Petersen approach and detachment of the tensor fascia lata from the ilium up to the tubercle of the gluteus medius.

This article reports on a surgical technique for periacetabular osteotomy that transfers an iliac bone segment with attached muscle, completely preserving the integrity of the proximal tensor fascia lata muscle and providing a vascularized bone graft at the site of maximum iliac displacement. An osteotomy at the level of the anterior inferior iliac spine creates a triangular bone segment with attached tensor muscle that can then be reattached in a manner that preserves normal anatomy.

SURGICAL TECHNIQUE

During the initial exposure, the interval between the sartorius and tensor fascia lata is developed distal to the anterosuperior iliac spine. In some
Take Home "Pearl"

"This technical modification in periacetabular osteotomy, along with secure internal fixation and complete avoidance of reflection or stripping of the lateral hip muscles (tensor and gluteal), enhances muscle function, bone healing, and early functional recovery."

cases, a small osteotomy of the anterosuperior iliac spine is completed, leaving a small fragment of bone to aid in eventual reattachment of the proximal sartorius.

During dissection of the sartorius from the tensor fascia lata, the lateral femoral cutaneous nerve is protected. The abdominal muscles are reflected from the iliac crest, leaving the tensor intact. The iliacus is reflected from the crest medially along with the tendon origin of the sartorius, completely preserving the longitudinal integrity of these muscles. Pelvic osteotomy cuts are completed (Figure 1).

The anterior iliac spine along with its slip of tensor fascia lata is rotated inferiorly to enhance anterior femoral head coverage (Figure 2). This results in the anterior iliac spine becoming quite prominent anteriorly.

Once the pelvic osteotomy is fixed with three or four screws, osteotomy is performed: approximately 2 cm (in the AP dimension) of the anterosuperior iliac spine at the level of the anteroinferior iliac spine is removed after two small holes are drilled into that segment (Figure 3). This permits transfer of this triangular bone segment along with its attached tensor muscle back to the distal surface of the main iliac segment (Figure 4).

Two corresponding drill holes are made in the most anterior portion of this segment. Heavy, nonabsorbable (no. 5 Ethibond) suture is then passed through these holes and around the transfixing screws so that when the suture is tightened, the bone graft is approximated to the ilium at the site of the osteotomy, preserving the tensor fascia lata anatomically (Figures 5 and 6) as well as providing a viable bone graft.
DISCUSSION

The principal advantage of this modification is the reduction of muscle distortion. Preserving the attachment of the tensor fascia lata does not compromise exposure. With the exception of the transverse muscle separation of the capsular iliocps, all muscles are preserved in length. This technical modification, along with secure internal fixation and complete avoidance of reflection or stripping of the lateral hip muscles (tensor and gluteal), enhances muscle function, bone healing, and early functional recovery.

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REFERENCES


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